

Pulmonary Embolism Treated with Low-Molecular-Weight Heparin After Pneumonectomy; Case Report

Embolism After Pneumonectomy

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Abstract

Pulmonary embolism after pneumonectomy is a well-recognised complication but it can be fatal. In this report we present a case of a 59-year-old male patient who admitted to our clinic with suddenly occurred dyspnea and chest pain after right pneumonectomy for lung cancer on 20th day of discharge. Computed tomography pulmonary angiography (CTPA) showed massive pulmonary embolism in the distal part of the left main pulmonary artery and partial-total filling defects in the upper and lower lobe segmenter-subsegmenter arteries. After diagnosis, we started to low molecular weight heparin (LMWH) for treatment twice a day. On sixth day of treatment patient was discharged with uneventful recovery.

Keywords

Pulmonary Embolism, Pneumonectomy, Anticoagulant Treatment

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Introduction

Pulmonary embolism can be seen after lung resections and it is one of the most severe life threatening complication. In patient who underwent lung resection, pulmonary embolism can cause postoperative deaths. Nagasaki and colleagues reported embolism rates between %15 and %20 after lung resection [1]. So that postoperative follow up and evaluation of symptoms should done carefully after lung resection particularly pneumonectomy. Especially if the stump of the pulmonary artery remain too long, it might predispose to thrombus in the contralateral artery owing to clothing. Early diagnosis and urgent treatment of pulmonary embolism should be performed immediately. It is important to decrease morbidity and mortality rates [2].

Case Report

A 59-year-old man had undergone right pneumonectomy for squamous cell carcinoma. He has 80 packet/year smoking, diabetes mellitus, hyperlipidemia and coronary artery disease on his resume. He didn't have any complication in early post operative period and discharged. On post operative day 20, the patient was admitted to our clinic because of chest pain and dyspnea. On physical examination, he was tachycardic and tachypneic. Saturation on transcutaneous pulse oximetry was 92% on 8 L/min nasal oxygen and arterial blood gas analysis was demonstrated hypoxia and hypocapnia (PO₂:48,6mmHg PCO₂:28,4 mmHg and O₂ saturation: %92,5). Pulmonary embolism was suspected due to high D-Dimer level. CTPA was performed for the evaluation of acute pulmonary embolism. CTPA showed massive pulmonary embolism in the distal part of the left main pulmonary artery and partial-total filling defects in the upper lobe segmenter-subsegmenter arteries (Figure 1). Subcutaneous LMWH Enoxaparine Sodium (Clexane® 6000 anti-Xa ; Sano-fi-Aventis) 2 x 0.6 ml was administered to patient. The patient whose symptoms were reduced, discharged from the hospital on 6th day, up to use clexane for 3 months. CTPA performed after sufficient medical treatment showed resolution of pulmonary embolism (Figure 2).



Figure 1. Oblique sagittal and coronal reformatted CTPA images after right pneumonectomy showing filling defects in the distal part of left main pulmonary artery and near total occlusion in the left lower lobe pulmonary artery branches. Partial filling defects in the left upper lobe pulmonary artery branches also can be seen.



Figure 2. Oblique sagittal and coronal reformatted CTPA images obtained from the parallel sections with the examination performed before the treatment showed resolution of pulmonary embolism.

Discussion

Most of patients who have malign diseases suffer from coagulation problems such as deep venous thrombosis, peripheral embolism and pulmonary thromboembolism. Mainly risk factors include immobilization, older age, previous surgery, familial disorders as well as malignancy. Pulmonary embolism (PE) which occurs after lung resection for carcinoma has high mortality. Especially after pneumonectomy mortality significantly increases [3]. When sudden chest pain and dyspnea occurs on the patients who had no problems after pneumonectomy, pulmonary embolism must be reminded. Early diagnosis and treatment of PE performed immediately. Morbidity and mortality may be decreased with urgent prophylaxis and intervention. We successfully managed the patient who developed PE after pneumonectomy with LMWH.

Early diagnosis can be provided by pulmonary artery angiography, spiral thorax tomography, V/Q scan and echocardiography. Nazeyrollas and Georgiou conclude that echocardiography was useful for diagnosis of PE [4,5]. Transthoracic echocardiography can be performed promptly at bed-side and shows ventricular dilatation, pulmonary artery pressure and ventricular hypokinesis. It predicts acute PE with a sensitivity of %96 and a specificity of %83 [4]. Paterson and co-worker emphasized role of thorax spiral CT [6]. In many institutions CT is routinely used to diagnose PE and it could safely replace pulmonary angiography. D-dimer is also useful for diagnosis of PE. High level of D-dimer is meaningful but it can be specious in some situations such as pneumonia, previous surgery, malign disorders and sepsis. Electrocardiography also can show PE with S1Q3T3. Transesophageal echocardiography can demonstrate the presence of a thrombus situation within the right atrium [2].

Treatment depends on patient's situation. Non-surgical treatment for patient in a stable condition or surgical treatment for patient in unstable condition and presence of ineffective thrombolysis should be considered. Non-surgical treatment includes anticoagulant drugs, thrombolytic drugs and inferior vena cava filter. Low-molecular weight heparin is effective for prophylaxis and treatment as well as heparin infusion. Thrombolytic treatment including streptokinase, urokinase and recombinant tissue plasminogen activator is recommended for treatment of PE but it also carries a high risk of hemorrhage on early post-operative period [3]. Urgent surgical treatment such as embolectomy is also effective. But mortality and morbidity increases with surgery. In the presence of massive embolism when thrombolytic treatment is ineffective surgical embolectomy or embolectomy with angiocatheter is adequate, while in the case anticoagulation therapies are contraindicated vena cava filters may be used.

Major complications of heparin treatment are bleeding, heparin induced thrombocytopenia and osteoporosis. Especially bleeding is an important cause of mortality. So it must be used carefully on patients who underwent surgery. LMWH are made by depolymerization of heparin. Its half-life is two to four times longer than heparin. It's applied two times a day by fixed doses. It doesn't require dose arrangement and control of APTT, thrombocytopenia and osteoporosis are seen less highly. It can be used safely on patients underwent surgery, because of less bleeding complications [7]. There isn't important difference about the effectiveness. Meanwhile in the case LMWH are used there is less risk for recurrent embolism, but the important point is that for this treatment patients performance should be fine enough, because this treatment modality is not recommended for patients whose performance is poor and who has massive embolism, severe obesity or renal failure [8].

As a result, embolism which occurs after lung resections are threat to life and it requires urgent treatment with early diagnosis. On patient who has risk factors for embolism, LMWH should be used for prophylaxis. On the other hand for avoiding from embolism some precautions such as varis socks and mobilization should be taken. Especially, patients who underwent pneumonectomy or lobectomy should be followed up carefully on postoperative period. If embolism has occurred in such patients, LMWH can be used safely, and it is as effective as heparine.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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